

continuation of Mr. Macoun's list will be looked forward to with interest. The apparent occurrence of natural hybrids of *Nuphar* (a characteristic, as appears from Mr. Thomas Meehan's publications, of the allied genus *Sarracenia*) is one among many points of interest in the work, and the flora with which it deals is characterized by possessing 37 species of *Astragalus*, 29 of *Potentilla*, 27 of *Ranunculus*, 26 of *Saxifraga*, 22 of *Viola*, 17 of *Ribes*, 16 of *Arenaria*, 14 of *Lupinus* and of *Anemone*, 13 of *Stellaria*, 12 of *Cornus*, 10 each of *Geum*, *Oenothera*, *Desmodium*, and *Claytonia*, 8 of *Acer*, 7 of *Rhus*, and 5 of *Parnassia*. Such a catalogue makes a botanist hope that it may be speedily followed by such a descriptive flora as shall be a credit to the largest of our colonies.

G. S. BOULGER.

MISCELLANEOUS.

Freshwater Sponges as Improbable Causes of the Pollution of River-water.

MR. POTTS reported that on the 9th of February he had visited and partially examined the forebay at Fairmount Waterworks, on the Schuylkill River, from which the water had been temporarily withdrawn, with a view to discover the winter condition of the freshwater sponges and the other inhabitants of that locality. He found by far the larger part of the wall-surface below the water-line inaccessible on account of a thick deposit of mud upon the bottom and much water remaining in the forebay. Wherever reached, however, and so far as the eye could detect in other places, it was covered by a mud-coloured incrustation of considerable thickness, which a more minute examination showed to be composed almost wholly of the statoblasts and spicules of the sponge *Meyenia Leidyi*. Some few fragments of *Meyenia fluviatilis* and *Spongilla fragilis* were seen, but the first-named was clearly the prevailing species.

A sluiceway which formerly supplied the last of the old "breast wheels" used in pumping into the reservoir, but from which the water had been for many months excluded, was entered and examined. Here the remaining incrustation (much having doubtless crumbled and fallen away) was from one fourth to one half an inch thick, of the appearance of crumbling plaster, and, as in the other cases, it consisted of the sponge before named, with but a small proportion of intruded material.

While considering the effect of the presence of so large a sponge-growth at the very inlet to the supply-pumps, Mr. Potts stated that this particular species was conspicuous among the known North-American sponges by its great relative density and the small proportion of its sarcode or flesh. Its decay, therefore, at the termination

of its period of summer growth would be a less cause of pollution to the water-supply than that of any other sponge.

Moreover, from recent investigations into the life-history of these low organisms, he was inclined to believe that decay was not the normal or necessary result of the close of each season's growth. The fragile branches of some species inhabiting exposed situations may, of course, be broken off and destroyed while the sarcode still covers them ; but in the sessile portions, and in all when sufficiently protected, the cells of the sarcode at the period of full maturity, forsaking their places along the lines of the skeleton framework, gather together by simultaneous amœboid movements into dense groups, where they are soon covered by a tough chitinous "coat," which, in time, generally becomes surrounded by a "crust" of minute granular cells, and armour-plated by a series of protective spicules. These groups are now recognized as the statoblasts, gemmules, or winter-eggs of the sponge—eggs only in appearance—in reality the resting-spores or protected germs which conserve the life of the individual through the cold and storms of winter, and awake very early in the springtime into new life—yet a continuance only of the same existence which was seen a few months before nestling into this winter's sleep.

If this is the ordinary course with these organisms there seems no reason to regard them as serious causes of the pollution of our streams, though violent freshets before this resting-period is reached may tear them to pieces, and their decay may give a temporary taint to the water.

Continuing the narrative of his exploration, Mr. Potts described the iron pipes which had lain for many years upon the bottom of the forebay, as covered, in some places to the depth of an inch or more, with a crust richly coloured by iron oxide, but principally composed, as were the others, of the spicules and statoblasts of *M. Leidyi*. Upon the surface of this crust in places he found the remains of large colonies of *Urnatella gracilis*, Leidy. In the absence of any positive knowledge of the winter condition of this curious polyzoan, Mr. Potts had examined with much interest a novel form of statoblast, which was frequent upon the same pieces of sponge ; but he was unsuccessful in associating it with the polyzoan. It is most probable that the life is continued, as suggested by Dr. Leidy, within the urn-like joints of this creature, and that they put out buds and a new growth in the spring. To discover if this were the case, he had placed some fragments in water, and while awaiting results he had been surprised at the appearance within a few days amongst the fragments of *Urnatella* of numbers of the recently described chaetobranch worm, *Manayunkia speciosa* of Leidy, as well as several living cells of a species of *Paludicella*, probably *P. elongata*, of the same author. The persistence and tenacity of life in these apparently delicate creatures, overcoming not only the severity of a hard winter, but an exposure of several days in the open air, were further commented upon.—*Proc. Acad. Nat. Sci. Philad.*, Feb. 12, 1884, p. 28.